Appl. No.: 10/723,956
Reply to Final Office Action of: November 25, 2005

Listing of Claims:

This listing of claims will replace all prior versions, and listing, of claims in the present application:

1.   (previously presented) A tape feeder for advancing a component-carrying tape to present sequential electronic components disposed in the tape at a pitch for assembly, the tape feeder comprising:

a feed sprocket having a number of teeth thereon and an encoder disc operatively associated with each other and rotatably disposed on a common axis;

a motor operatively connected to the feed sprocket to repetitively rotate the feed sprocket over an angle corresponding to the pitch of the component-carrying tape;

an encoder disposed to read the encoder disc and provide a feedback signal indicating the angular position of the feed sprocket; and

the encoder disc having two rings of lines, the first ring having a line spacing corresponding to the pitch of the component-carrying tape, and the second ring having a line spacing less than the pitch of the component-carrying tape and substantially greater than the number of teeth on the feed sprocket.

2.   (original) The tape feeder of claim 1 further comprising a worm gear operatively associated with the feed sprocket and encoder disc and rotatably disposed on their common axis to impart angular velocity of the worm gear to the feed sprocket and the encoder disc.

3.   (original) The tape feeder of claim 2 further comprising a worm shaft coupled to the motor and engaged with the worm gear.

4.   (original) The tape feeder of claim 2 wherein the feed sprocket and the encoder disc are attached to the worm gear.

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5.   (original) The tape feeder of claim 4 wherein the feed sprocket and the encoder

disc are fastened to a hub of the worm gear.

6.   (original) The tape feeder of claim 1 wherein an upper tape feed track directs the

component-carrying tape into engagement with the feed sprocket.

7.   (original) The tape feeder of claim 6 further comprising a housing, wherein the

upper tape feed track is formed in the housing and the motor, feed sprocket and encoder disc are

mounted in the housing.

8.   (original) The tape feeder of claim 7 wherein the housing has a window formed

therein positioned in communication with the upper tape feed track to allow removal of

components from the component-carrying tape.

9.   (original) The tape feeder of claim 8 wherein the window is positioned proximate

the engagement of the feed sprocket and the component-carrying tape.

10.   (cancelled)

11.   (cancelled)

12.   (previously presented) The tape feeder of claim 1 wherein the second ring has

about 2500 lines.

13.   (original) The tape feeder of claim 1 wherein the axis of rotation of the worm

gear is defined by a pair of ball bearings.

14.   (original) The tape feeder of claim 13 wherein the ball bearings are biased in the

axial direction to remove radial and axial play.

15.   (withdrawn) The tape feeder of claim 1 further comprising a pull-off wheel for

removing a cover tape from the component-carrying tape.

16.   (withdrawn) The tape feeder of claim 15 wherein the pull-off wheel has a tire thereon formed of a resilient material.

17.   (withdrawn) The tape feeder of claim 15 wherein the pull-off wheel is rotated by a belt riding in a groove in the worm gear.

18.   (withdrawn) The tape feeder of claim 16 wherein the cover tape is biased against the tire by a spring wheel.

19.   (previously presented) The tape feeder of claim 1 wherein the second ring has a number of lines which is at least 10 times greater than the number of teeth.

20.   (previously presented) The tape feeder of claim 19 wherein the encoder has a quadrature output to multiply a number of encoder pulses into a higher number of counts.

21.   (previously presented) The tape feeder of claim 19 wherein angular position and speed of the feed sprocket are determined by an output of the encoder reading the two rings of lines on the encoder disc.